

REMARKS

The foregoing Amendment and remarks which follow are responsive to the Final Office Action of March 22, 2006. In that Office Action, the Examiner objected to the drawings for purportedly failing to show the features recited in Claims 16 and 17. Further, the Examiner rejected Claims 16-17, 19-24, 31-32, and 34-37 under 35 U.S.C. §112 ¶2 for purportedly failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. The Examiner also rejected Claims 16-17, 19-23, 31-32, and 34-35 under 35 U.S.C. §102(e) as being anticipated by U.S. Pat. No. 6,642,609 to Minamio, et al. (hereinafter "MINAMIO"), and rejected Claims 24-26, 28-30, and 36-37 under 35 U.S.C. §103(a) as being unpatentable over MINAMIO in view of U.S. Pat. No. 5,942,794 to Okumura, et al. (hereinafter "OKUMURA"). For the following reasons, Applicant respectfully submits that the drawings illustrate all of the features recited in the pending claims, and that all of the pending claims are in condition for allowance.

1. *The Drawings are Compliant Under 37 C.F.R. §1.83(a)*

In the Office Action, the Examiner objected to the drawings under 37 C.F.R. §1.83(a) for purportedly failing to show every feature of the invention specified in the claims. The Examiner asserted that the drawings failed to show certain features recited in Claim 16, as well as Claim 31.

As a first ground for the objection, the Examiner asserted that the drawings did not show "the bottom surfaces of the inner and outer leads of each set which are of the second length and the first length, respectively, are completely exposed in the encapsulation material and arranged to intersect a single straight line extending between the outer leads" as set forth in Claim 16. Applicant respectfully submits that this feature is clearly illustrated in FIG. 7, where leads 730 are segregated into outer leads 730d and 730e, and inner leads 730a, 730b, and 730c (specification, page 9, lines 8-10). As explained in the Brief Description of the Drawings, FIG. 7 is "a bottom view of a semiconductor package... having exposed exterior surfaces or lands..." (specification, page 5, lines 28-30). In FIG. 7, the bottom surfaces of the outer leads 730d and 730e are illustrated as having a first length, with the bottom surfaces of the inner leads 730a, 730b, and 730c being illustrated as having a second length. With regard to the feature of the

“leads ... arranged to intersect a single straight line extending between the outer leads,” Applicant submits that the “single straight line” referenced in Claim 16 is an imaginary line superimposed on the exposed bottom surfaces of the leads 730a-730e and extending from the outer lead 730d to the outer lead 730e in generally parallel relation to the adjacent liner peripheral edge segment of encapsulation material 10 or package body of the semiconductor package 800. Such an imaginary line will intersect each of the outer leads 730d and 730e, as well as the inner leads 730a, 730b, and 730c. Therefore, Applicant respectfully submits that each of the features recited in Claim 16, and in particular, those features the Examiner asserted to be lacking in the drawings, are readily apparent from FIG. 7 in its current form.

As a second ground for the objection, the Examiner asserted that the drawings did not show “exposed portions of the bottom surfaces of the inner and outer leads of each set being arranged to intersect a single straight line extending between the outer leads” as set forth in Claim 31. For the same reasons set forth above in relation to Claim 16, Applicant respectfully submits that the features of Claim 31 are readily apparent from the existing drawings, and in particular from FIG. 7 in its current form.

Reconsideration and withdrawal of the objection to the drawings is respectfully requested, as the features recited in Claims 16 and 31 are clearly illustrated therein.

2. Claims 16-17, 19-24, 31-32, and 34-37 Are Not Indefinite

The Examiner also rejected Claims 16-17, 19-24, 31-32, and 34-37 as being indefinite under 35 U.S.C. §112 ¶2 for purportedly failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention.

The Examiner asserted that the term “arranged to intersect a single straight line extending between the outer leads” in Claim 16 is indefinite because it is not clear which elements are arranged to intersect. Consequently, dependent Claims 17 and 19-24 were also rejected on the same basis. As previously asserted, the “single straight line” referenced in Claim 16 is an imaginary line superimposed on the exposed bottom surfaces of the leads 730a-730e and extending from the outer lead 730d to the outer lead 730e in generally parallel relation to the adjacent liner peripheral edge segment of encapsulation material 10 or package body of the semiconductor package 800.. Applicant submits that the so-called “elements” arranged to

intersect such an imaginary line are the portions of the bottom surfaces of the inner and outer leads of each set which are of the second length and the first length, respectively, and are completely exposed in the encapsulation material. As set forth in currently amended Claim 16, the “...portions of the bottom surfaces of the inner and outer leads of each set which are of the second length and the first length, respectively, are completely exposed in the encapsulation material and are arranged to intersect a single straight line extending between the outer leads.” As such, the “elements” are defined by two characteristics: 1) the elements are completely exposed in the encapsulation material; and 2) the elements are arranged to intersect a single straight line extending between the outer leads. Applicant respectfully submits that this interpretation is consistent with grammatical rules and with the interpretation that would be given by one of ordinary skill in the art. Accordingly, it is submitted that Claim 16 is not indefinite.

The Examiner has asserted that the term “the inner and outer leads of each set being arranged to intersect a single straight line extending between the outer leads” in Claim 31 is indefinite because it was not clear where the exposed portions of the bottom surfaces of the leads are arranged to intersect. Dependent Claims 32 and 34-37 were also rejected on the same basis. For the same reasons set forth above in relation to Claim 16, Applicant respectfully submits that Claim 31 is not indefinite.

Based on the foregoing, Applicant respectfully submits that the phrase “arranged to intersect a single straight line...” does not render Claim 16 indefinite and that the phrase “the inner and outer leads of each set being arranged to intersect a single straight line...” does not render Claim 31 indefinite. Additionally, Applicant submits that Claims 17 and 19-24 are in condition for allowance as being dependent upon allowable base Claim 16, and Claims 32 and 34-37 are in condition for allowance as being dependent upon allowable base Claim 31.

3. Independent Claims 16 and 31 are not Anticipated by MINAMIO

As amended, independent Claim 16 recites that “the portions of the bottom surfaces of the inner and outer leads of each set which are of the second length and the first length, respectively, are completely exposed in the encapsulation material and are arranged to intersect a single straight line extending between the outer leads.” Similarly, independent Claim 31

describes “*the portion of the bottom surface of each of the outer leads of each set which is completely exposed in the encapsulation material being of a first length, the portion of the bottom surface of the inner lead of each set which is completely exposed in the encapsulation material being of a second length which is unequal to the first length, and the exposed portions of the bottom surfaces of the inner and outer leads of each set being arranged to intersect a single straight line extending between the outer leads.*”

MINAMIO discloses a semiconductor device which, as best shown in Figures 4-6, comprises a plurality of leads 4, 5, each of which defines a land electrode 16. The leads 4, 5 are covered by a resin encapsulant 15 such that the land electrodes 16 are exposed in a bottom surface of the resin encapsulant 15. As is best shown in Figure 4 of MINAMIO, the land electrodes 16 defined by the leads 5 are segregated into four sets which extend along and to a respective side of the generally square resin encapsulant 15. The land electrodes 16 defined by the leads 4 are also segregated into four sets which extend along respective sets of the land electrodes 16 defined by the leads 5. However, none of the land electrodes 16 defined by the leads 4 extends to a side of the resin encapsulant 15. Rather, each set of the land electrodes 16 defined by the leads 4 is located between one side of the die pad 1 and the inner ends of the adjacent set of land electrodes 16 defined by the leads 5, such inner ends being those which are disposed closest to the die pad 1. Thus, as is described in MINAMIO, the bottoms of the leads 4, 5 (i.e, the land electrodes 16) exposed out of the resin encapsulant 15 are arranged in two lines like a “hounds-tooth check” (see column 8, lines 50-53).

In MINAMIO, within each of the adjacent sets of the land electrodes 16 defined by the leads 4, 5, two of the leads 5 define the outermost pair of land electrodes 16. Applicant respectfully submits that Figure 4 of MINAMIO clearly shows that the land electrodes 16 of those leads 4, 5 of each of the adjacent sets which extend between the two outer leads 5 defining the outermost pair of land electrodes 16 are not each arranged to intersect a single straight line extending between such outer leads 5. Rather, as indicated above, the land electrodes 16 defined by the leads 4 of each of the adjacent sets are disposed closer to the die pad 1 and inwardly beyond the innermost ends of the corresponding set of land electrodes 16 defined by the leads 5. Thus, even assuming, *arguendo*, that the land electrodes 16 defined by the leads 4 are each of a length differing from the length of each land electrode 16 defined by the leads 5, Applicant

respectfully submits that the language of independent Claims 16 and 31 is still not satisfied by MINAMIO since each of the adjacent sets of the land electrodes 16 defined by the leads 4, 5 are not arranged to intersect a single straight line extending between an outer pair of the leads 5 of such adjacent sets.

Thus, based on the foregoing, Applicant respectfully submits that independent Claims 16 and 31 are in condition for allowance, as are Claims 17, 19-24, 32 and 34-37 as being dependent upon respective allowable base claims.

4. Independent Claim 25 is not Rendered Obvious by MINAMIO and OKUMURA

Independent Claim 25 describes the encapsulation material as “defining a bottom surface which includes a peripheral edge, the encapsulation material covering the inner lead, the outer leads and the semiconductor chip such that the portions of the bottom surfaces of the inner and outer leads of each set which are of the second length and the first length, respectively, are completely exposed in the encapsulation material and extend to the peripheral edge of the bottom surface.” Applicant respectfully submits that the language of independent Claim 25 is not satisfied by MINAMIO. As indicated above, none of the land electrodes 16 defined by the leads 4 extend to a side of the resin encapsulant 15. Rather, each set of the land electrodes 16 defined by the leads 4 in MINAMIO is located between one side of the die pad 1 and the inner ends of the adjacent set of land electrodes 16 defined by the leads 5, such inner ends being those which are disposed closest to the die pad 1.

In apparent recognition of this deficiency in MINAMIO, the Examiner relies upon OKUMURA for its purported teaching regarding the exposed portions of the bottom surfaces of inner and outer leads each extending to a peripheral edge of the bottom surface of an encapsulation material. In this regard, the Examiner appears to conclude that it would have been obvious to one of ordinary skill in art to modify each of the leads 4 in MINAMIO such that the land electrodes 16 defined thereby each extend to a respective peripheral side of the resin encapsulant 15. However, Applicant respectfully submits that MINAMIO is completely devoid of any teaching or suggestion which supports such hypothetical modification. It is well settled that to find an invention obvious in view of a combination of references, there must be some suggestion, motivation, or teaching in the prior art that would have led a person of ordinary skill

in the art to select the references and combine them in a way that would produce the claimed invention.

In describing the semiconductor device shown in Figures 4-6 thereof, MINAMIO explicitly teaches:

“The respective bottoms of the land leads 4, exposed on the bottom of the resin encapsulant 15, and the respective side faces and bottoms of the leads 5, exposed on the bottom and side faces of the resin encapsulant 15, are used as the land electrodes 16. These land electrodes 16 will be external terminals when the package is mounted onto a motherboard like a printed wiring board. These bottoms of the leads 5 and land leads 4 are exposed out of the resin encapsulant 15 and arranged in *two lines like a hounds-tooth check*.” [Emphasis added] (MINAMIO, column 8, lines 44-52).

As further stated in MINAMIO:

“In this manner, the resin-molded semiconductor device of the first embodiment can be a land grid array (LGA) package. That is to say, external terminals are arranged in *two lines like a hounds-tooth check* on the bottom of the package. Specifically, the land electrodes 16 of the land leads 4 have their bottoms exposed *along the inner one of the two*, while the land electrodes 16 of the leads 5 also have their bottoms exposed *along the other outer line*.” [Emphasis added] (MINAMIO, column 9, lines 19-26).

Based on the aforementioned excerpts from MINAMIO, Applicant respectfully submits that it is clearly only with the application of disfavored hindsight that the teachings of OKUMURA could be combined therewith to support a hypothetical modification of the leads 4 in a manner wherein the land electrodes 16 defined thereby are extended to the same peripheral side of the resin encapsulant 15 to which the land electrodes 16 of the leads 5 of the corresponding set are extended.

On the basis of the foregoing, Applicant respectfully submits that independent Claim 25 is in condition for allowance, as are Claims 26 and 28-30 as being dependent upon an allowable base claim.

Application No.: 09/687,048
Response to Office Action of March 22, 2006
Attorney Docket: AMKOR-052A

5. Conclusion

On the basis of the foregoing, Applicant respectfully submits that the stated objections and grounds of objection have been overcome, and that Claims 16, 17, 19-26, 28-32 and 34-37 are now in condition for allowance. Additionally, Applicant respectfully submits that the present Amendment does not introduce new issues which would require further searching on the part of the Examiner, and therefore respectfully requests that the same be considered and entered by the Examiner. An early Notice of Allowance is therefore respectfully requested.

If any additional fee is required, please charge Deposit Account Number 19-4330.

Respectfully submitted,

Date: 5/22/06

By:



Customer No.: 007663

Mark B. Garred
Registration No. 34,823
STETINA BRUNDA GARRED & BRUCKER
75 Enterprise, Suite 250
Aliso Viejo, California 92656
Telephone: (949) 855-1246
Fax: (949) 855-6371